



# **Feasibility of Adding Plastic Containers and Film to Curbside Recycling**

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For

## **Metro**

Portland Area Metropolitan Service District

Prepared by  
**Moore Recycling Associates Inc.**



## Executive Summary

Moore Recycling investigated the feasibility of adding additional plastic collection to the Portland Metro area curbside programs. We focused on the long-term strength of the plastic container market and the plastic film market. In addition, we considered processing issues for containers and film but not collection ones.

As expected, we found strong demand for both material types at present. The export market continues to have a strong interest in purchasing mixed resin plastic to compete with domestic buyers and secure low-cost feedstock. The export market does pose a risk because most material is going to China. Chinese customs agents are now enforcing China's ban on the importation of unprocessed post-consumer plastic. This risk is not confined to the plastic container market; it also applies to all post-consumer plastic bales sold to China.

While the export market is the dominant buyer today, the domestic market is a more reliable indicator of the long-term strength of the market for curbside collected containers and film. Therefore our recommendations are based on the ability to sell to domestic buyers.

### Containers

Metro region curbside collection data for 2002 shows a 25% overall recovery rate for the 16 million pounds of rigid plastic packaging generated. This translates to slightly less than 700,000 pounds of rigid plastic packaging disposed of each month. If this fraction were to be recovered at the same rate as bottles (about 50% recovery), the region would generate about 350,000 pounds per month of rigid plastic packaging.

There is a demand of 5.5 million pounds per month in total for Mixed Rigid plastic, and Commingled Bottles and Containers<sup>1</sup> from buyers that purchase material from Oregon. Marketing these materials carries some risk if:

- Demand is reduced due to economic downturn,
- A large supply of off-spec virgin becomes available,
- Chinese demand for post-consumer resin drops significantly likely causing increased supply available to domestic buyers.

According to analysts, virgin HDPE prices are expected to remain strong for the next two years.

Another marketing option is to mix curbside collected containers with colored HDPE bottles. There is a strong regional domestic demand for colored and natural HDPE bottles—close to 30 million pounds per month. When added to colored HDPE, mixed

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<sup>1</sup> Definitions are in the body of the report on page 3



containers comprise up to 10 percent of the colored HDPE mix. Buyers of this material use the olefin fraction only (i.e., high and low density polyethylene, #'s 2 & 4 and polypropylene #5) This post-consumer market's primary risk is from substitution by off-spec virgin resin.

Given the strength of domestic demand and the range of marketing options, the long-term indicators for successful marketing of curbside generated containers are positive, especially for the entire olefin fraction. Moore Recycling believes that processing of containers is not a constraining factor for adding containers to curbside collection. Curbside collection of containers will only be an issue for those areas that do not use roll carts.

Moore Recycling recommends adding containers to Metro's curbside collection program.

### **Film**

Metro region curbside collection data for 2002 shows almost 3 million pounds of clean plastic bags were disposed in curbside garbage that could have been set out for recycling. This is about 250,000 pounds per month. Approximately 25% of all plastic produced globally is film. Based on North American resin sales data, 81.8% of film production is polyethylene (PE) film. Given the large potential supply, and the versatility of PE film as a feedstock, demand for recovered PE film is strong and growing especially as manufacturers explore alternatives to high cost virgin resin. Demand from the export market appears insatiable today but, as noted with containers, this study uses domestic demand as a benchmark.

The export market is the primary buyer of curbside film, especially from the Western U.S. Export buyers are able to pay a higher price than domestic buyers. But, because of China's ban on the importation of unprocessed post-consumer plastics, this report is focused on the domestic market.

We found domestic demand for film of roughly 60 million pounds per month from buyers that source material from the Northwest. All the buyers we spoke with expressed interest in purchasing clean curbside film, but we were only able to confirm one company that is actively buying curbside film from West Coast sources—Hilex Poly. None of the buyers have the capacity to clean curbside film on the West Coast so they need either very clean curbside film or very cheap film to justify shipping to their facilities in the East or end-use applications with broad specifications.

There is a growing trend in curbside film collection, particularly in CA., where the number of curbside programs grew from two to over a dozen in one year.

Adding plastic film to curbside collection will only be a collection issue for those areas that do not use roll carts.



The cost and capability to collect and process very clean curbside film<sup>2</sup> are not well known. The long-term indicators for marketing film plastic are positive, including curbside film, if collection and processing issues can be addressed.

Without further information about Metro area MRF's capabilities and processing contracts, Moore Recycling cannot make a recommendation about adding plastic film to Portland Metro's curbside collection program.

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<sup>2</sup> Clean curbside film means clean dry bags that are specifically put in curbside bins by the public for recycling in a bag-in-bag style, no incidental bags such as dirty or wet trash bags that end up in the recycling stream



## Findings

### *Introduction*

Moore Recycling Associates Inc. prepared this analysis of the depth of the Oregon scrap plastic marketplace with particular emphasis on communities adding curbside containers and film plastic.

The scrap plastic market today is overheated. Pricing is historically high, demand is very strong from both domestic and export markets. Everyday new buyers enter the marketplace looking for scrap plastic as a lower-cost substitute feedstock due to very high virgin resin prices. This is a good time to consider broadening collection to include new plastic materials, and a good time to establish relationships with buyers. Timing is good, but only if one enters the marketplace prepared for the times when demand is not as hot as it is today. It is generally agreed among scrap industry professionals that pricing will drop, demand will ease, specifications will tighten and marketing materials will become more difficult.

In our conversations with buyers, the prevalent response we received was, “we’ll take whatever you want to collect.” After looking into the market further, we found that there are strong markets (both export and domestic) for Bulky High Density Polyethylene (HDPE) items and Commercial and Mixed film. The markets for Mixed Rigid plastics, Commingled Bottles and Containers, and Curbside Film are somewhat less strong. None of the buyers of plastic (domestic or export) want foamed polystyrene (PS) containers.

### *Definitions*

#### Bottles and Containers

**N HDPE** = Natural HDPE bottles

**C HDPE** = Colored HDPE Bottles. Note: Specifications vary depending on the buyer.

Some buyers may allow the market mix of injection grade containers (no foamed PS); these buyers will discard all non-olefin bottles and containers.

**PET** = PET bottles and jars

**Epic Grade** = All 2-7 bottles and containers (specifically including N HDPE) at market mix (no foamed PS)

**Bulky HDPE** = Large HDPE items (buckets, crates, toys, trays, furniture, bins, barrels etc...). This category is often referred to as “Injection HDPE”

**Mixed Rigid** = Bulky HDPE, 3-7 bottles and 1-7 containers (no foamed PS). Markets expect 70% Bulky HDPE and 30% bottles and containers. Note: some exporters cannot accept tubs that contained dairy products due to smell.



**Commingled Bottles and Containers** = All bottles and containers (no foamed PS).

Buyers generally expect approximately 40% PET bottles, 40% HDPE bottles and no more than 20% 3-7 bottles and 1-7 containers

### Film

**Commercial Film** = Clear, clean PE film including stretch wrap and poly bags

**Mixed Film** = Mixed color, clean PE film including grocery bags

**Curbside Film** = Mixed PE film generated at a MRF

**Clean Ag Film** = Agricultural PE film, dry from uses that do not touch the ground - up to 10% contamination

**Dirty Ag Film** = Agricultural PE film from the ground up to 30% contamination

### ***Container Markets***

#### Export

Export buyers continue to show a strong interest in purchasing all mixed resin plastic especially if it has high olefin content. Olefin resins include HDPE, LDPE, and PP. In addition, many of the bottles and containers marked with a "7 other" are olefin-based plastic. In general, export buyers are not able to compete with domestic buyers, who purchase HDPE only, but they are able to buy mixed resins and sort them at a lower cost than domestic buyers. Therefore they purchase mixed plastic as a way to compete with domestic buyers and secure low cost feedstock.

Most plastic exported offshore from Oregon goes to China, either directly or via other Asian countries. The export market does pose a risk as a long-term buyer of scrap plastic—for three reasons:

- Chinese customs agents are enforcing China's ban on the importation of unprocessed post-consumer plastic. This has increased the risk (and cost) to import plastic and has placed additional restrictions on what exporters will purchase (e.g., no smelly food containers, no PS foam plastic).
- China has made significant investments in virgin PE resin capacity, making future demand for scrap PE uncertain. The ban on unprocessed post-consumer material is used as a tool by Chinese authorities to protect their investment in virgin capacity.
- China is rapidly developing a scrap plastic collection infrastructure, thus the availability of locally generated scrap is growing. Local scrap production is increasing in part because of post-consumer collection but even more because of the growth of industrial activity in China. As we outsource our plastic product manufacturing facilities, we lose domestic industrial scrap generation as it moves to China along with the production.



Other Asian countries (India, Indonesia, Korea and Vietnam) are showing interest in mixed resin material but at this time only India appears to have an infrastructure able to handle on-going supplies. Much more than the Chinese export buyers, Indian exporters have historically entered and exited the market: more active when resin pricing is high and less active when resin pricing is low.

### Domestic

The domestic market is a better indicator of the long-term strength of the market for curbside-collected containers.

The current demand for Mixed Rigid plastic and Commingled Bottles and Containers is 5.5 million pounds per month. These are buyers that make mixed resin products such as lumber, railroad ties, garden products and transport packaging. They prefer the olefin fraction but will tolerate and do use the non-olefin bottles and containers (the exception to this is that most pull out all PET and PVC bottles and none want foamed PS). These markets are growing as our economy grows. The primary risk involved with mixed resin products is a significant downturn in the economy, and if mixed resin demand from China drops significantly, these buyers will drop their price, but their demand will remain constant.

There is a large and growing demand for HDPE bottles. The three principal buyers in the west acknowledge that they receive a mixture of plastics when they purchase C HDPE (reportedly up to 25% non-HDPE bottles in bales of C HDPE). Injection containers are up to 10 percent of the colored HDPE mix from communities that ask for all bottles and containers (the remaining up-to 20% of non-HDPE bottles consists of PET, PVC and other bottles as well as aluminum cans, film and other contamination).

Of the three buyers, KW has the most stringent specifications and would prefer that the injection grade material was not included with the colored HDPE, but KW buyers acknowledge that KW can and does use the olefin fraction of the injection containers. Talco and EcoPlas also use the olefin fraction they receive in C HDPE bales, but unlike KW, they are willing to accept (and have uses for) olefin injection containers as part of the C HDPE bottle mix as long as it arrives in the normal market mix (up to 10% injection containers). They would prefer not to get PET, PVC, and PS bottles or containers. The major risk to this market is the same as HDPE injection: off-spec resin. Virgin resin pricing is expected to remain strong for the next two years so it is unlikely that there will be large quantities of off-grade available except for short periods of time.

We found a strong market for HDPE items—demand well in excess of 20 million pounds per month of domestic current demand from buyers that source in Oregon. Most of these buyers are seeking Bulky HDPE grade material such as buckets, crates, tubs, toys, storage bins and lawn furniture. They are less (or in some cases not) interested in small HDPE containers such as yogurt cups and butter tubs.



This market offers the opportunity to move bulky plastic that inadvertently gets into the curbside program or through commercial recycling efforts. We are not aware of any communities that actually ask the public for these bulky items, but since the demand is so strong, it is something to consider. The biggest risk to this market is the availability of off-spec virgin resin, which can substitute for recovered resin. It is possible that there will be significant off-spec available as PE plants that were pulled off line or reduced production because of Hurricane Katrina are put back on line. This effect will likely be temporary.

The long-term indicators for marketing injection grade containers are very positive, especially for the entire olefin fraction.

### ***Film Markets***

There is a strong demand for film plastic from both domestic and export buyers, especially commercial film, and mixed color, clean film. Domestic demand is approximately 60 million pounds per month. Trex alone needs 34 million pounds of film per month and expects that demand to grow to greater than 83 million pounds per month in the next few years.

If construction slows substantially, domestic film demand will slow since much of the end market use for film is tied to construction material demand. It's doubtful that construction will drop off significantly in the mid term given the need for massive reconstruction stemming from hurricane damage. If China backs away from purchasing film, substantial domestic demand will remain, although the price may drop, particularly on the West Coast where the export market has a stronger influence over scrap pricing. Currently, domestic buyers are struggling to source inexpensive agricultural and curbside material because exporters are offering over \$0.06 per pound for most scrap film material.

While there is little curbside film available, there is growing, if somewhat tentative, interest in curbside film. We were unable to locate any written specifications for curbside film but a Trex buyer said that when (not if) it does develop one, it would be similar to its grocery bag specification (see appendix B). All the buyers on the following "Film Market Chart" listed as "possible market for curbside" have indicated they will purchase clean, dry curbside film. Generally this means bags that are specifically put in curbside bins by the public for recycling in a bag-in-bag style. These possible curbside buyers do not want incidental bags such as dirty or wet trash bags that end up in the recycling stream. We discuss processing of film later, but for curbside collection, we strongly recommend a bag-in-bag format

Trex is seriously exploring the use of more curbside film because their buyers are not able to source enough Commercial or Mixed film. The problem is that Trex does not have a wash line in the Western US. As noted, Trex could use curbside if very clean or if it is inexpensive enough to warrant shipping it to their facility in Winchester, VA. Trex buys lower quality curbside material from communities in Chicago and New York, but Trex's buyers have voiced concern over buying such poor quality material from the West Coast.



Trex has not yet purchased material from the multiple curbside programs in California that have recently expanded to handle film.

Ed Haenni, Director Strategic Projects for Hilex Poly, wrote to Moore Recycling, “You can pass on to the Oregon community that the Progressive Bag Alliance will guarantee to purchase curbside collected plastic bags”. The Progressive Bag Alliance (PBA) was formed this year with the following mission: “The Progressive Bag Alliance is dedicated to ensuring that plastic bags are recycled, reused and disposed of properly.” To learn more about PBA visit <[www.progressivebagalliance.com/](http://www.progressivebagalliance.com/)>.

The long-term indicators for marketing film plastic, including curbside film, are very positive. Of more concern are the issues of collecting and processing curbside film and bags.

***List of Buyers:***

***Exporters, Domestic Markets, Brokers***

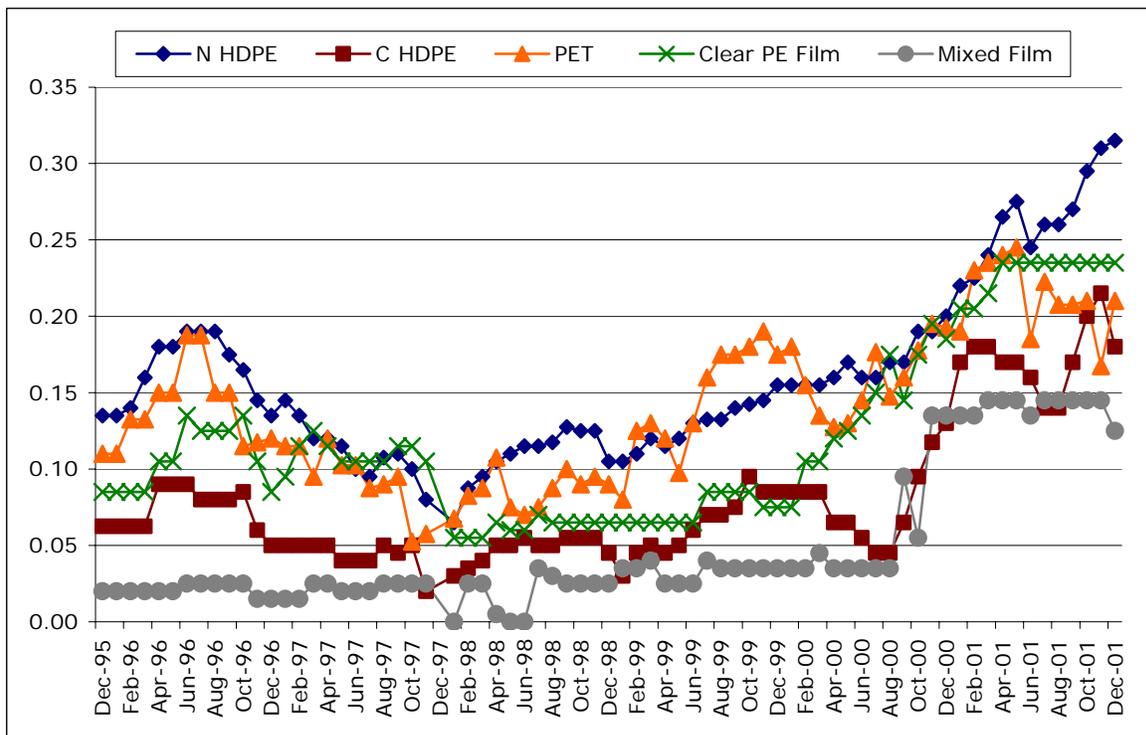
Moore Recycling developed a list of buyers of containers, film plastic and colored HDPE. We show general purchase specifications (and end use application if they are available). These lists are in Appendix A. We believe the lists are comprehensive for domestic buyers of curbside containers from Oregon. Appendix A is not a complete list of export buyers from Oregon: we only included a few as examples. We are in the process of updating all of our plastic market information, please check the website [www.nwplasticmarkets.com](http://www.nwplasticmarkets.com) for updates.

For detailed buyer-specific specifications please see Appendix B.



*Scrap Prices:  
Historical Prices*

**Figure 1 – Oregon Scrap Plastic Pricing Trends, 2000 to 2005**



The prices in Figure 1 are adjusted from Moore Recyclings’ CA plastic price history to reflect pricing from Oregon. Scrap prices in Oregon are generally slightly lower than California prices because of increased transportation costs—both domestic and export. This price spread has been exacerbated this year because of the reduction in railroad access. We had limited data from which to make the adjustment, therefore they might not be entirely accurate, but they do accurately show trends. We are happy to further modify these prices if additional Oregon market data becomes available.

The 2005 price history in Table 1, is based on several data points, some from Metro area processors and some internal Moore Recycling data. It represents scrap values from the Portland Metro area. While we believe this information is fairly accurate, again our data was limited. We would welcome additional data to more accurately reflect price scrap plastic price history.

The prices in the category Commingled Bottles and Containers should be comparable to the value that Metro area processors are getting for their “all bottle” bales. In our



discussions with exporters, we learned that the "all bottle" bales being generated in the Metro area include a significant percentage of containers; therefore the material is priced as 40-40-20<sup>3</sup> material (one export buyer thought the average mix from suppliers in the region was 45-45-10). When asked how Metro area residents being asked for containers might affect material value, most exporters felt there would be no change in value unless the percentage of 3-7 bottles and 1-7 containers went above 20%.

**Table 1 - 2005 Scrap Plastic Price History**

Month	N HDPE	C HDPE	PET	Clear PE Film	Mixed Film	Curbside Film	Epic Grade	Bulky HDPE	Mixed Rigid	Commingled Bottles and Containers
Jan-05	\$0.220	\$0.170	\$0.190	\$0.205	\$0.135	\$0.040	\$0.135	\$0.060	\$0.030	\$0.118
Feb-05	\$0.225	\$0.180	\$0.230	\$0.205	\$0.135	\$0.050	\$0.175	\$0.060	\$0.030	\$0.120
Mar-05	\$0.240	\$0.180	\$0.235	\$0.215	\$0.145	\$0.050	\$0.185	\$0.060	\$0.045	\$0.150
Apr-05	\$0.265	\$0.170	\$0.240	\$0.235	\$0.145	\$0.040	\$0.165	\$0.090	\$0.050	\$0.150
May-05	\$0.275	\$0.170	\$0.245	\$0.235	\$0.145	\$0.050	\$0.170	\$0.090	\$0.060	\$0.158
Jun-05	\$0.245	\$0.160	\$0.185	\$0.235	\$0.135	\$0.050	\$0.175	\$0.110	\$0.070	\$0.145
Jul-05	\$0.260	\$0.140	\$0.223	\$0.235	\$0.145	\$0.050	\$0.188	\$0.110	\$0.085	\$0.150
Aug-05	\$0.260	\$0.140	\$0.208	\$0.235	\$0.145	\$0.050	\$0.195	\$0.120	\$0.080	\$0.145
Sep-05	\$0.270	\$0.170	\$0.208	\$0.235	\$0.145	\$0.060	\$0.200	\$0.120	\$0.080	\$0.140
Oct-05	\$0.295	\$0.200	\$0.210	\$0.235	\$0.145	\$0.040	\$0.205	\$0.125	\$0.090	\$0.125
Nov-05	\$0.310	\$0.215	\$0.168	\$0.235	\$0.145	\$0.060	\$0.235	\$0.150	\$0.090	\$0.115
Dec-05	\$0.315	\$0.180	\$0.210	\$0.235	\$0.125	\$0.045	\$0.215	\$0.150	\$0.100	\$0.120

<sup>3</sup> Commingled Bottles and Containers (no foamed PS): Buyers generally expect approximately 40% PET bottles, 40% HDPE bottles and no more than 20% 3-7 bottles and 1-7 containers



***Cost Benefit Analysis***

Given that the single sort value of Metro area material is already priced as Commingled Bottles and Containers, Moore Recycling compared the scrap value of material using three possible bottle and container sorts in Table 2.

- 1 Sort = Commingled Bottles and Containers
- 2 Sorts = PET and “everything else” (comparable to the Epic Grade)
- 3 Sorts = PET, NHDPE and “everything else”

**Table 2 – Net Value from Sorted Plastics**

<b>Month</b>	<b>1 sort</b>	<b>2 sort</b>	<b>3 sort</b>
Jan-05	\$0.118	\$0.157	\$0.188
Feb-05	\$0.120	\$0.197	\$0.209
Mar-05	\$0.150	\$0.205	\$0.214
Apr-05	\$0.150	\$0.195	\$0.217
May-05	\$0.158	\$0.200	\$0.221
Jun-05	\$0.145	\$0.179	\$0.187
Jul-05	\$0.150	\$0.202	\$0.197
Aug-05	\$0.145	\$0.200	\$0.191
Sep-05	\$0.140	\$0.203	\$0.205
Oct-05	\$0.125	\$0.207	\$0.223
Nov-05	\$0.115	\$0.208	\$0.215
Dec-05	\$0.120	\$0.213	\$0.219

Generally a three-sort system has higher value material but it is also more costly to sort. A two-sort system’s material value is only slightly less than the three-sort and significantly higher than the value of a single sort. Metro region MRF’s may want to consider utilizing a two-sort system, especially since the output from a two-sort system has ready domestic markets as well as the current strong export market demand.



***Processing Issues:  
Sorting Options, Best Practices***

Some of the key variables for the successful processing of containers and film are incentives for MRF's to collect the plastic, management competence, proper training of staff, communication during processing, the wide range of equipment options, ability of operators to adjust equipment, speed and depth of fiber lines, number and placement of sorters, flow of material and sequence of separation, and ratio of size of facility to through put.

Once material enters the MRF, specific conditions at the MRF affect the quality and recovery of material. Facilities that process material under protected structures are more likely to generate cleaner material. Also, facilities that contain material in bunkers or cages during processing (rather than loose in piles), generally have cleaner material with less material loss.

Containers

Processing containers is not significantly different from processing plastic bottles. Where and how the material is dumped upon entering the facility, how it's presorted, how many screens are used, and the angle of the screens all affect how much of the material is lost in the front end. For example, wet conditions may require a different screen angle for optimal separation of containers and paper.

The presort area is the time and place where large bulky items are pulled (e.g., large metal objects, whole OCC boxes). Presort provides the opportunity to recover bulky HDPE plastic items too (crates, storage bins, lawn furniture, etc.). Optimal conditions at the presort stage are manageable piles for the number of sorters available, with depths that allow the sorters to see the material clearly. If the belt moves the material too quickly, there is the strong possibility for plastic bottles and containers to accidentally be pulled along with bulky items or trash bags.

On the fiber line, the conveyor speed affects the amount of plastic bottles and containers that end up in the fiber piles. If the material moves too quickly, containers slip past the sorters. A slow conveyor may result in deep fiber piles inhibiting sorters' ability to pick bottles and containers from the fiber stream. How the operator monitors and adjusts the conveyor speed is crucial to optimal sorting. Few MRF's provided quality control tests of fiber loads, so there is little data about the actual amount of plastic material in paper bales. In general, MRF's that generate material for domestic mills or mills that provide feedback on quality, often seek higher quality and therefore dedicate the time to conduct quality control tests.

Some MRF facilities reprocess their residual line, or the end of the container line, resulting in very few plastic bottles and containers lost as residual.



In general, the lowest percentages of plastic loss are in facilities with newer equipment; those with operators well-trained in running the equipment; and in facilities that reprocess their residual lines.

The primary operating decision when adding plastic containers is to determine how material will be sorted.

### Film

Clearly, the Metro region should continue collecting film from commercial sources and from established public drop offs. Ideally all film should be collected prior to contamination (e.g., drop off sites, commercial collection with OCC, and onsite consolidation for large generators) in order to maintain broad market options and rely less on low value markets or markets that wash material in distant locations. There are excellent opportunities to increase commercial recovery of film as haulers realize the value and ease of collecting bagged film with OCC. Where OCC is generated, there is usually film, and since film is so bulky, generators can potentially cut down on disposal costs as they divert film from their waste stream.

Collecting film for recycling is fairly new, and the public, as well as commercial generators, need more information about the opportunities to recover film plastic. The American Plastics Council has an online calculator ([www.plasticbagrecycling.org/cal](http://www.plasticbagrecycling.org/cal)) that helps businesses analyze the economics of film recovery. We can provide an Excel version of the calculator upon request. We recommend you explore other sections of the site in addition to the calculator section.

More film is generated in the commercial sector than residential, but residential film generation is significant and should not be overlooked. Drop off programs open to the public are under utilized; therefore, curbside collection is the obvious next step to improve film recovery rates. We do not expect residential curbside collection to negatively impact potential clean supplies, because bags are a small portion of the film stream collected at the retail level compared to stretch film.

Curbside film collection appears to be a growing trend based on conversations with MRF operators, markets, and public agencies. Nearly 2-dozen communities now ask residents to recycle film curbside. Most of these programs are in CA. Single stream MRF's already receive film in the recycling stream and must pull the film early in the process to avoid production inefficiencies. For that reason, many MRF's already pull, bale, and market film; baled curbside film has some value.



Communities with healthy recycling participation are better candidates for film collection than communities less likely to bag multiple bags in one bag. “Bags in a bag” collection cuts labor cost at the MRF level. It also limits contamination as less surface area is exposed. The cost of film processing is very dependent on the material coming into the facility.

Several MRF managers have voiced concern over the cost to process increasing film volumes, particularly if the scrap value softens. Of the six MRF’s we contacted that process film, four found that film volume doubled once they began asking the public to include bags (D.A.R.T.’s monthly tonnage went from 20 tons to 40 tons). One program saw no difference and one has not yet asked the public to include bags. None of these four MRF’s added personnel when they began collecting bags from the public.

Expansion is another issue for MRF’s. Film collection requires more space and some dedicated labor, so a MRF with room to expand is more likely to adapt to film collection than MRF’s with space constraints.

**Communities that Ask Residents to Recycle Film Curbside**

Campbell, CA  
Cupertino, CA  
Dana Point, CA  
Del Norte, CA  
Elk Grove, CA  
Fresno, CA  
Los Altos, CA  
Los Angeles, CA (partial)  
Los Gatos, CA  
Monte Serrano, CA  
Morgan Hill, CA  
Rancho Cordova, CA  
Sacramento County (uninc.)  
San Clemente, CA  
San Jose, CA (partial)  
Santa Clara, CA  
Santa Clara County, CA (uninc.)  
Santa Cruz County, CA (uninc.)  
Saratoga, CA  
Seattle, WA

**Operators of MRFs Recovering Film Interviewed for this Project:**

Bestway Recycling (Los Angeles, CA)  
BFI (Milpitas, CA)  
Del Norte Recycling (Oxnard, CA)  
Green Team (San Jose, CA)  
Rabanco (Seattle, WA)  
Sunset Waste (Fresno, CA)

The MRFs that are successfully processing curbside film, pull the film very early in the process and have at least two dedicated film pickers (we’ve found that most single stream MRF’s already have these employees in place because single stream already gets a significant amount of film—some of these MRF’s discard the film as contamination due to space constraints, others recover it). Large pieces of film such as strings of stretch

wrap, should be pulled prior to it going on the conveyor (at the same time bulky plastics and metal are pulled) If the film plastic is allowed to travel over the screens (especially star screens) it is likely to wrap around the screens rendering them less functional and reduce the effectiveness of the entire processing facility. This is why curbside collection of film is of such concern.



MRFs that are prepared to handle film increase the efficiency of the MRF by removing film and by not allowing tramp film onto the screens. Four of the six MRF's we contacted that handle film collect it at every station. They use a basket (or the equivalent) with a plastic bag inside. Pickers are asked to pull any bags or film that they find and stuff them into the basket. Once it is full, the picker removes the bag of bags, ties it up and replaces the bag. By collecting film at every location, MRF operators are finding that the quality of their fiber has improved and they are gaining the value of the material.

Because of its very high volume-to-weight ration, film plastic does not store well in bunkers, it must be contained either in movable roll-offs, other moveable containers or in a compactor. Moisture is a problem for most film markets, so collection in a dry area is ideal.

The increase in labor cost to scrap value ratio may not be as attractive as other commodities but curbside film collection can be done as San Jose's Green Team has illustrated for over 4 years.

Recommendations for the successful processing of plastic bottles, containers and film:

- Educate residents so that incoming stream is as clean as possible
  - for film utilize a bags-in-a-bag approach
- Strive to handle the appropriate tons per hour for the MRF
- Adjust belt speed so that fiber piles do not grow too deep
- Remove film plastic before material goes through the screens
- Have every picker pull film
  - utilize baskets (or bins) with bags in them for collection
- Add a second screen to single screen system
- Send residuals back through the system
- Train employees regularly
- Provide "instant" communications between "down stream operations" (e.g., the baling station) and the picking lines to report any problems as soon as possible
- Add sorters at the point where fiber flows into the baler, to avoid bottle loss or film in fiber bales
- Ask for feedback from material buyers.



### References

The following are contact names of facilities that we believe are doing a good job collecting containers and/or film:

D.A.R.T. (County Sanitation District of Los Angeles County)

Navnit Padival

562-699-6401

DART is successfully pulling out curbside film, Bulky HDPE and Mixed Rigid plastics. They are marketing them to domestic and export buyers.

West Coast Recycling - A Norcal Company

Leno Bellomo

415-330-2972

West Coast pulls out Bulky HDPE and Mixed Rigid plastics.

BFI - Milpitas, CA

Mark Buntjer

408-262-1401

BFI is pulling out and marketing, to domestic and export buyers, several categories of plastic including Mixed Rigid plastics and curbside film.

Each the above parties have been contacted and they are fine with the idea of being used as an example for other MRF's.

### ***Recommendations: Conference Call***

Metro region curbside collection data for 2002 shows a 25% overall recovery rate for 16 million pounds of all plastic containers generated. Of the 12 million pounds disposed, about 8 million pounds are rigid plastic packaging (8 oz. to 5 gallons). In addition, almost 3 million pounds of clean plastic bags were disposed in curbside garbage that could have been set out for recycling. Recycling processors recovered 100,000 pounds of bags that were improperly set out with curbside recyclables (this data likely underestimates current recovery of plastic bags from curbside programs).

Given the likely level of collection in the Portland Metro area, we believe that markets, today or in the future, are not a constraining factor for moving forward with curbside container or film collection.



### Containers

Moore Recycling believes that processing of containers is not a constraining factor for adding containers to curbside collection. MRF operators will need to decide how they want to sort plastics. This decision will depend on material value, space requirements and market preferences. Moore Recycling recommends a two-sort system.

Curbside collection of containers will only be an issue for those areas that do not use roll carts. We contacted several programs that collect 1-7 bottles and containers utilizing curbside stacking crates. These recycling coordinators told us that if there is an overflow issue, householders request additional bins. We also found many programs that expanded collection when they switched from crates to roll-carts.

Moore Recycling recommends adding plastic containers to Metro's curbside collection program.

### Film

Moore Recycling believes that the overall cost to process film is a possible constraining factor for adding film to curbside collection. MRF operators will need to determine if they are getting significant amounts of film already, how it is currently impacting their operations and if they have the capacity to capture film. An additional factor is determining the likely level of compliance with bag-in-bag promotion and education. If there is already film in the curbside program, will an education program stressing bagging film help mitigate loose film in the MRF?

Adding plastic film to curbside collection will only be a collection issue for those areas that do not use roll carts. It is possible that film and bags will blow out of crates, even with strong bag-in-bag education and promotion.

Without further information about Metro area MRF's capabilities and processing contracts, Moore Recycling cannot make a recommendation about adding plastic film to Portland Metro's curbside collection program.

### Conference Call

Patty Moore and Nina Bellucci are prepared to participate in a conference call with Solid Waste Directors in the Metro Region at your convenience.



**APPENDIX A**  
**CONTAINER MARKETS**

Company	Type of Plastic Purchased	Type of Buyer	Capacity/ Demand	End Use
Agri-Plas 948 Mc Nary Estates Keizer, OR 97303 Dari Jongsma 503-390-2381 <a href="mailto:jdariagriplas@yahoo.com">jdariagriplas@yahoo.com</a>	Mixed Rigid; Bulky HDPE; All olefin plastic including ag (e.g., PP twine & plant pots)	Processor (Grinding)	1 million lbs/month Total: film and rigid	Transport Packaging
Amigo Environmental 801 Chelsey Ave. Richmond CA 94801 Jack Mason 510-231-6810	Bulky HDPE	Processor (Grinding) Reclaimer	120,000 lbs/month	To polymer blending Cos to make a variety of new products
Avangard 3000 Brittmoore Houston, TX 77043 Jose Boza 713-895-9697	Bulky HDPE; Mixed Rigid	End Market	1.9 million lbs/ month	Railroad Ties
Champion Polymer PO Box 115-1114 Houston, TX 77082 Susan Groves 280-558-7740 <a href="mailto:sgroves@championpolymer.net">sgroves@championpolymer.net</a>	All scrap PP; Bulky HDPE	End Market	17 million lbs/month	Pipe Septic Products
Continental Recycling 750 El Camino Real Tuscon CA 92780 Bharat Gala 909-628-0033	Commingled Bottles & Containers; Mixed Rigid; Bulky HDPE	Exporter	1 million lbs/month Total: film and rigid	To India
Epic Plastic 104 East Turner Rd. Lodi, CA 95240 Frank Cvetovac 209-333-6161 ext 22 <a href="mailto:fcvetovac@epicplastics.com">fcvetovac@epicplastics.com</a> <a href="http://www.epicplastics.com">www.epicplastics.com</a>	Epic Mix; Commingled Bottles & Containers (beginning Q1 '06)	End Market	1.5 (growing to to 2 million) lbs/ month	Garden products Decking
GMR, LLC 350 7th Ave. 11th Floor New York, NY 10001 Igor Beylin 646-442-6241 <a href="mailto:ibeylin@generated.net">ibeylin@generated.net</a>	Mixed Rigid (no dairy tubs); Bulky HDPE	Exporter	Unknown	Unknown



APPENDIX A  
CONTAINER MARKETS (cont.)

IntegriCo Composites, llc East Camelback Rd, Suite 100 Scottsdale, AZ 85251 (the plant is located in Ogden, UT) Chris Brough 480-974-0496 <a href="mailto:chris@integricollc.com">chris@integricollc.com</a>	Mixed Rigid; Bulky HDPE	End Market	1 million lbs/mo	Transport Packaging and one proprietary use
Jetway Trading Company 1801 Mount Vernon Avenue Pomona CA 91768 Edward Liu 909-865-8963 <a href="mailto:edwardliu@prodiqy.net">edwardliu@prodiqy.net</a>	Commingled Bottles & Containers; Mixed Rigid; Bulky HDPE	Exporter, Broker, Handler	Unknown	Various
Ming's Recycling Corp. 3316 47th Ave. Sacramento, CA 95824 Kenny Luong 916-421-5054 <a href="mailto:mingsrecycling@sbcglobal.net">mingsrecycling@sbcglobal.net</a>	Commingled Bottles & Containers; Mixed Rigid; Bulky HDPE	Exporter, Broker, Handler	Unknown	Various
M & L Plastics, Inc. 2233 Huntington Dr. Ste 10 San Marino, CA 91108 Brenda Lee 626-278-8899 <a href="mailto:brenda@mlplastics.net">brenda@mlplastics.net</a>	Commingled Bottles & Containers; Mixed Rigid; Bulky HDPE	Exporter, Broker	Unknown	Various
Pralumex, Inc. 19903 Tennessee Trail Walnut, CA 91789 Luke Loekman 909-549-7070 <a href="mailto:plastic@pralumex.com">plastic@pralumex.com</a>	Commingled Bottles & Containers; Mixed Rigid; Bulky HDPE	Exporter, Broker	Unknown	Various

HDPE BOTTLE MARKETS

Company	Type of Plastic Purchased	Type of Buyer	Capacity/ Demand	End Use
EcoPlas 1769 Mt. Vernon Ave. Pomona, CA 91768 Parham Yedidsion 909-590-5730	N HDPE; C HDPE	Reclaimer	2 million lbs/month	Many including bottles, packaging, pipe and consumer products
Talco Plastic 3270 E 70th St. N. Long Beach, CA 90805 Stan Kezar 562-630-1224 <a href="mailto:stan@talcoplastics.com">stan@talcoplastics.com</a>	N HDPE; C HDPE	Reclaimer	2 million lbs/month and expanding	Many including bottles, packaging, pipe and consumer products
KW Plastic PO Drawer 707 Troy AL 36081 Scott Saunders 800-633-8744 <a href="mailto:scott.saunders@kwplastics.com">scott.saunders@kwplastics.com</a>	N HDPE; C HDPE; Bulky HDPE (no 5 gallon buckets)	Reclaimer	25 million lbs/month	Many including bottles, packaging, pipe and consumer products



**APPENDIX A**  
**FILM AND BAG MARKETS**

Company	Type of Plastic Purchased	Type of Buyer	Capacity/Demand	End Use
Agri-Plas 948 Mc Nary Estates Keizer, OR 97303 Dari Jongsma 503-390-2381 <a href="mailto:jdariagriplas@yahoo.com">jdariagriplas@yahoo.com</a>	All Grades of film	Processor	1 million lbs/mo Total: film and rigid	Transport Packaging
A.E.R.T. inc. 313 E. Monroe Lowell, AR 72745 Doug Brooks 479-756-7406 <a href="mailto:dougbrooks@aert.com">dougbrooks@aert.com</a>	Commercial Film; Mixed Film; Possible market for Clean Ag film and Curbside	End User Cleaning System (Proprietary)	8 million lbs/month	Plastic Lumber "Choice Dek"
Commercial Plastic Recycling 1752 Iver St. Colorado Springs, CO 80910 Chuck Miller 719-634-4646 <a href="mailto:chuckm@cprinc.net">chuckm@cprinc.net</a>	Mixed film; Commercial film; Curbside film; Clean Ag film	Processor/ Reclaimer	1 million lbs/month	Agricultural Applications
Continental Recycling 750 El Camino Real Tuscon CA 92780 Bharat Gala 909-628-0033	Mixed film; Commercial film; Curbside film; Clean Ag film	Exporter	1 million lbs/month Total: film and rigid	To India
Heilex Poly North Vernon, IN David Pulling 812-346-1066 ext. 250 <a href="mailto:david.pulling@hilexpoly.com">david.pulling@hilexpoly.com</a>	Mixed film; Commercial film; Curbside film; Clean Ag film	Processor/ Reclaimer	1.2 million lbs/month	Bags
ITW Angleboard 1429 S 40th Ave. Ste A Phoenix, AZ 85009 Antonio Brister 602-284-4068 <a href="mailto:tbrister@angleboard.com">tbrister@angleboard.com</a>	Commercial Film; Mixed Film; Possible market for Curbside	End User	2.4 million lbs/mo	Angle Board (protective packaging)
Jetway Trading Company 1801 Mount Vernon Ave Pomona, CA 91768 Edward Liu 909-865-8963 <a href="mailto:edwardliu@prodigy.net">edwardliu@prodigy.net</a>	Mixed film; Commercial film; Curbside film; Clean Ag film	Exporter, Broker, Handler	Unknown	To China
Ming's Recycling Corp. 3316 47th Ave. Sacramento, CA 95824 Kenny Luong 916-421-5054 <a href="mailto:mingsrecycling@sbcglobal.net">mingsrecycling@sbcglobal.net</a>	Mixed film; Commercial film; Curbside film; Clean Ag film	Exporter, Broker, Handler	Unknown	To China
NextLife Recycling Alliance 1801 S. Federal Hwy Ste 305 Delray Beach, FL 33483 Elliot Schragar 877-698-5433 <a href="mailto:elliott@nextlife-recycle.com">elliott@nextlife-recycle.com</a>	Commercial Film; Mixed Film; Possible market for Curbside	Cleaning System (Proprietary)	12 million lbs/mo	Ag, automotive, and container products
Trex Company (Plant is in Fernley, NV) Mark Grilo Boise, ID 208-362-9410 <a href="mailto:mgrillo@trex.com">mgrillo@trex.com</a> Nick Candela Oceanside, CA 760-295-7348 <a href="mailto:ncandela@trex.com">ncandela@trex.com</a>	Commercial Film; Mixed Film; Possible market for Curbside	End User	34 million lbs/mo.	Decking



## **APPENDIX B**

### **TREX GROCERY SACK SPECIFICATIONS**

**Item: PG-501**

**Source: Grocery Sack, Store Collection Programs**

#### **Content Specifications:**

- Polyethylene content greater than 95%.
- Less than 5% blue colored bags.
- No moisture – dry bales only.
- No trash, food, or loose paper inside bales (store receipts are acceptable).
- No PVC (meat wrap is PVC) or PVDC (Saran) films.
- No polystyrene, polyurethane foam, Polypropylene or PET.
- No hazardous material, medical wastes, nor containers used to package these products.
- No pallets.
- Plastic or metal banding is acceptable. If wire, must be 13 g. or smaller.

#### **Bale Size/Markings**

##### **Bale Dimension:**

24" x 36" x 42" minimum to 36" x 48" x 72" maximum.

##### **Bale Weight:**

750 lbs. Minimum to 1,200 lbs. maximum

##### **Other:**

Truckload shipments only.

Trucks to be floor loaded without pallets.

Bale integrity must be maintained throughout shipping, unloading, and storage.

##### **Markings:**

Bill of lading to list supplier's name, Trex Company Item # and PO #

##### **General**

Good faith effort to eliminate all forms of trash and contamination. No trash, food or loose paper inside bales.



## **GMR, LLC**

**Material:** Mixed Rigid Plastic (MRP)

**Buyer:** GMR, LLC

**Price:** FOB facility dock<sup>4</sup>

**D & B:** 18-958-6881

**Container Size:** 40' High Cube

**Minimum Weight:** 38,000 lbs

**Bale Size:** 48" X 36" X 36" (L x W x H)

Different bale sizes are acceptable if minimum weight is achieved.

**Maximum Contamination:** 10%

*\*No organic contamination*

### **Acceptable Plastics:**<sup>5</sup>

- All 1 and 5 gallon buckets *with* metal handles attached
- All plastic drums, totes & empty garbage cans (*any size; with or without metal*)
- Milk/Soda crates, laundry baskets, lawn furniture
- Plastic toys & playhouses, children's electronics, pet carriers
- Plastic pallets, shelving, coolers, closet organizers
- Plastic landscape & microwave trays, flower pots (*no soil*)
- 5 gallon water bottles, PVC blister pack (*Non-film plastic packaging*)
- Automotive plastics
- Bumpers, bed liners, side-view mirrors, grills, lights, hub-caps

### **Non Acceptable Components:**

- Glass; Metal; Wood; Paper; Clothes, Styrofoam
- Poly-Coated Paper (Orange juice & milk cartons)
- PVC Pipe/Tubing, Vinyl Siding
- Plastic Film (Grocery bags & Stretch film)
- Flexible Water Hoses, Hazardous material, Medical waste
- Narrow-neck liquid containers- Used small-mouth container
- Small plastic containers (Yogurt cups, PET/HDPE Bottles, etc.)

*For more information or to request a pick up, contact project manager*

*Igor Beylin at (646) 442-6246*

[ibeylin@generated.net](mailto:ibeylin@generated.net)

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<sup>4</sup> Price varies due to region & quality

<sup>5</sup> Do not load any heavily soiled material with heavy dirt contamination or any food residue.